REMARKS

The present application has been reviewed in light of the Office Action dated July 24, 2003. Claims 1-4 and 15-28 are presented for examination, of which Claims 1 and 4 are in independent form. No claim amendments are included in the present Response. Favorable reconsideration is respectfully requested.

The Office Action states that Claims 1, 3, and 4 are rejected under 35 U.S.C. § 102(b) as being anticipated by Japanese Patent No. 11-341722 (Yamamura et al.); that Claims 2, 15, and 21 are rejected under § 103(a) as being unpatentable over Yamamura et al. in view of U.S. Patent No. 5,121,021 (Ward); that Claims 16 and 22 are rejected under § 103(a) as being unpatentable over Yamamura et al. in view of Ward, and further in view of U.S. Patent No. 5,304,885 (Wong et al.); that Claims 17-19 and 23-25 are rejected under § 103(a) as being unpatentable over Yamamura et al. in view of Ward, and further in view of U.S. Patent No. 3,095,515 (Case et al.); that Claims 20 and 26 are rejected under § 103(a) as being unpatentable over Yamamura et al. in view of Ward, and further in view of U.S. Patent No. 5,949,172 (Katagiri); and that Claims 27 and 28 are rejected under § 103(a) as being unpatentable over Yamamura et al. in view of U.S. Patent No. 6,057,626 (Tanaka et al.).

Applicants respectfully traverse the above rejections and submit that independent Claims 1 and 4, together with the claims dependent therefrom, are patentably distinct from Yamamura et al. for at least the following reasons.

Claim 1 is directed to a direct current (DC motor), and Claim 4 is directed to an AC commutator (Universal) motor. Both the DC and the AC motors include a stator with 2P

poles, a rotor core, a commutator, and a concentrated winding rotor. In the DC motor, the rotor core includes a core of ferromagnetic material having a number slots S and a number of teeth S separated from a stator core by an airgap, and the commutator includes a number of segments that is greater than the number of rotor slots S.

In the AC motor, the rotor core includes a core of ferromagnetic material having a number of slots S and a number of teeth S separated from a stator core by an airgap. Each pole of the stator includes a coil wound around a tooth of the core of ferromagnetic material, such that the stator and the rotor core form part of a magnetic circuit. The commutator includes a number of segments Z that is bigger than the number of rotor slots S.

One of the notable features of Claims 1 and 4 is that the concentrated winding rotor in each of the DC motor and the AC motor includes a plurality of simple non-overlapping coils of insulated wire mounted on a same rotor tooth. Each coil is wound around a single tooth only, and a terminal of each of the coils is connected to different segments of the commutator. This feature eliminates the problem in conventional motors of circulating currents in the windings caused by parallel paths with unequal induced voltages, as discussed on page 2 *et seq.* of the specification. The circulating currents cause unwanted heating of the coils and the brushes of the conventional motors, thus reducing their efficiency. With the concentrated winding rotor of Claims 1 and 4, however, the path voltages are balanced, because the coils wound on a single tooth are distributed in different winding paths. Consequently, circulating currents are avoided.

Yamamura et al. relates to a motor armature with a plurality of coils wound around each tooth. The coils on each tooth are coupled in parallel to corresponding segments of

a commutator. More specifically, as understood by Applicants, Yamamura et al. teaches that multiple coils wound on the same tooth are always connected in parallel, such that the terminals of the multiple coils are always connected to the same segments of a commutator (see, for example, Claim 1 and the abstract).

As shown in Fig. 2 of Yamamura et al., the first coil wound around the tooth 21d is connected to segments 7 and 2 of the commutator; and as shown in Fig. 5 of Yamamura et al., the second coil wound around the tooth 21d also is connected on segments 7 and 2 of the commutator. Similarly, Figs. 2 and 4 show that both the first coil and the second coil wound around the tooth 21b are connected to segments 3 and 8 of the commutator; and Figs. 3 and 5 show that both the first coil and the second coil wound around the tooth 21a are connected to segments 1 and 6 of the commutator.

Applicants submit that the figures in Yamamura et al. clearly show that coils wound around the same tooth are connected in *parallel* to the *same* commutator segments, such that the coils are placed in the same armature winding path (i.e., path between two brushes) of the motor. As such, Applicants believe that Yamamura et al. *teaches away* from the concentrated winding rotor of Claims 1 and 4, in which coils wound around the same tooth are connected to *different* commutator segments.

Further, Applicants note that Fig. 8 of Yamamura et al. shows equalizer connections (i.e., wires between the commutator segments) for completing (closing) the armature winding paths. This indicates that the configuration of coils in the Yamamura et al. armature does not permit balanced distribution of the internal voltages in the armature winding paths.

In summary, whereas Yamamura et al. teaches an armature in which a plurality of coils wound on the same tooth are connected in *parallel* to the *same* segments of the commutator, in the concentrated winding rotor of Claims 1 and 4, in contrast, the plurality of coils wound on the same tooth are connected to *different* segments of the commutator and thus *cannot* be connected in parallel. By connecting the coils to different segments of the commutator, the coils are not placed in the same armature winding path of the motor but instead are distributed to different armature winding paths, which acts to balance the sum of the internal voltages in each armature winding path and eliminate circulating currents.

Nothing has been found in Yamamura et al. that is believed to teach or suggest a motor that includes a concentrated winding rotor "having a plurality of simple non-overlapping coils of insulated wire mounted on a same rotor tooth, with each coil wound around a single tooth only, and with a terminal of each of the coils being connected to different segments of the commutator," as recited in Claims 1 and 4. Accordingly, Applicants submit that Claims 1 and 4 are not anticipated by Yamamura et al., and respectfully request withdrawal of the rejections under 35 U.S.C. § 102(b).

The other rejected claims in this application depend from either Claim 1 or Claim 4 and therefore are submitted to be patentable for at least the same reasons. Because each dependent claim is also deemed to define an additional aspect of the invention, individual reconsideration of the patentability of each claim on its own merits is respectfully requested.

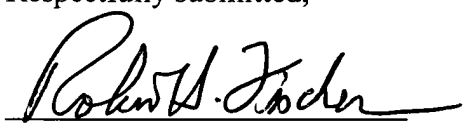
In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

No petition to extend the time for response to the Office Action is deemed necessary for the present Response. If, however, such a petition is required to make this Response timely filed, then this paper should be considered such a petition and the Commissioner is authorized to charge the requisite petition fee to Deposit Account 06-1205.

CONCLUSION

Applicants' undersigned attorney may be reached in our New York Office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,



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